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" Scire est nescire, nisi id me
Scire alius sciret."

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THE ASSOCIATION BETWEEN GOITRE AND ATROPHIC RHINITIS.*

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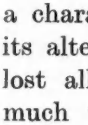
THE association between the endocrine glands and the nose has long been recognized. One may instance the turbinal engorgement and increased secretion following sexual excitement, the so-called " honeymoon catarrh." Again, many observers, especially on the Continent, have believed that there is a direct connection between goitre and atrophic rhinitis. It was this, in particular, that it was resolved to examine when this investigation was begun exactly seven years ago, in February, 1927, both because the thyroid is the only endocrine gland that lends itself readily to clinical examination, and also because this is the only gland-substance that can be easily administered by mouth with a reasonable certainty of foreknown results.

* A paper read before the Bristol Medico-Chirurgical Society on Wednesday, 10th January, 1934, when fifteen patients were shown to demonstrate the clinical condition described.

The classical picture of atrophic rhinitis is that of an adult, more often than not female, surrounded by a characteristic sour fetor which gives the condition its alternative name of "ozœna," but having herself lost all sense of smell; whose nasal chambers are much wider than normal, without turbinal bodies, and occupied by masses of sour, green, dry secretion. And it is said that the "disease" is becoming rare. No doubt the recognition of sinus infection and the better treatment of syphilis (the stink from a necrotic vomer must be experienced to be believed) have eliminated many cases that would formerly have filled this category. But if by atrophic rhinitis we mean only a condition of abnormal patency of the nose due to atrophy of the turbinal bodies and bones, there are still to be found many cases, although perhaps relatively few of them present the extreme degree of atrophy that was once considered necessary for inclusion under this head.


Normal.

A1.

A2.

A3.

A4.

A5.

FIG. 1.

In the normal nose, when we examine the interior by means of a forehead mirror or light, we see that the turbinal bodies, and especially the inferior, do not quite touch the septum, but the narrow space between fades into the obscurity at the back of the nose where details cannot be made out. (Fig. 1.) Abnormally, however, it may be possible to see past the turbinals quite back into the naso-pharynx, and to discern the red colour of the back wall, and the movements

there which accompany deglutition. This may be taken as the least evidence of definite atrophy, and we have called this A2. A1 is reserved for conditions where the turbinal bodies are obviously smaller than normal, but the test just described does not apply. A3 means definite, unequivocal atrophy; the inferior turbinals are very much smaller than normal, so that the middle turbinals (which are generally less affected in these cases) stand out prominently in the upper part of the nose near the septum. A4 means that the inferior turbinals are practically absent, and the outward curve of the vomer at the back of the nose is well seen; the middle turbinals, also, are clearly smaller than usual, and one can see the front of the sphenoid. A5 is the most extreme degree, in which hardly any vestiges of turbinals can be seen, and generally the sphenoidal ostium is visible from the nostril.

Observing a large series of these cases, and watching the progress in some over several years, one conceives the atrophic process as affecting primarily the soft parts, especially the erectile tissue (thus explaining why the inferior turbinals are most manifestly affected in the earlier stages). But later on there is a gradual absorption of the actual turbinal bones, so that the picture of more advanced atrophy is seen; it seems impossible to draw a hard-and-fast line between one stage and another. Of course, when suppurative rhinitis or syphilitic disease attacks the turbinal bones, a rapid and severe destruction is produced, and possibly then a different pathology accounts for the atrophy of the soft parts.

The mucous membrane in the early stages is pale, thin and "poor-looking." It appears as if ciliary activity was lost. Later it becomes dry, and in about

half of these cases (in all groups) small scabs of drying secretion lie on the surface. In another type there is a very remarkable excess of glairy, "milky-watery" mucoid secretion, and this, as is shown in the table, is not confined to those cases where the atrophy is least, but may occur in even the most extreme atrophy. Purulent secretion is not very common, apart from sinus disease, or in association with crusting. Actual gross crusts are naturally most often seen in the cases with very wide nasal chambers; drying, rather than any specific infective or other cause, seems to determine their presence. Where the nasal passage is very wide the covering is a squamous epithelium, with very little mucous secretion.

In addition to the abnormal patency and nasal secretions, other features to which attention was directed in the cases to be described below were (1) anosmia, loss or diminution of sense of smell; (2) fetor, an unpleasant odour perceived by the observer, generally the typical sour smell of mucus, but not always associated with crusts or excess of mucoid secretion; (3) cacosmia, an unpleasant smell observed by the patient; (4) perforation of the septum; (5) secondary drying or other effects in the pharynx or larynx; (6) the Wassermann reaction, and other evidence of syphilis; (7) the condition of the accessory sinuses. Some of the more important of these are indicated in the table (see pages 94 and 95).

The clinical material consists of 473 cases: (*a*) all cases on my index as "syphilitic rhinitis," (*b*) all cases of atrophic rhinitis, and (*c*) all cases of goitre seen during the seven years. All cases of traumatic origin, whether accidental or surgical, are excluded. In the

table these have been divided into various groups according to the probable causative factor, and the age and sex distribution, degree of atrophy, etc., are indicated for each group (bold figures). Neglecting for the moment 31 cases in which the atrophy was slight, there are 334 cases of atrophic rhinitis, 188 "definite," 109 severe, 37 either definite or severe. When we endeavour to assign cases to their groups some difficulty arises; for example, among the "goitre" group are 5 cases in which symptoms were ascribed to an acute specific fever, and 3 cases of severe anæmia. Any patient who definitely or probably had had syphilis is included in that group, although there were several with goitre. We will leave the "goitre" group for discussion later, and ignore the small groups associated with anæmia (which, as a group, closely resembles the exanthem group), lupus, and the "miscellaneous" that have not been easily classified.

Syphilis: 125 patients, 80 males. Four-fifths of all these patients were above the age of 30, and in each age-group males are nearly twice as frequent as females, probably from unequal incidence of the original disease. It must be remembered that syphilitic patients with normal noses or those indexed under "polypi," "sinus disease" and the like are not included, owing to the labour involved in searching for them; also, many patients with minor degrees of atrophy may have been overlooked. But, even allowing for this, a remarkable feature of this group is the large proportion of patients with *severe* atrophy, 53 being graded A4, 27 A5. 83 patients had fetor, among whom 63 showed extreme atrophy, 37 perforation of the septum, 54 had crusts in the nose, 47 cacosmia, 67 anosmia. Among the 42 patients without fetor only 17 showed extreme atrophy, 5 perforation of the septum, only 5 had nasal crusting, 11 cacosmia, 23 anosmia (see p. 101). Most of the patients with purulent discharge had cacosmia. But even among those with extreme atrophy

On the left is shown the suggested ætiology with age and sex distribution: on the right
The centre portion is an

Ætiological Group.	Sex.	Age Group. 0—14	15—20	30—44	45—	Complaint. Goitre	Catarrh.	Fetor.	Dry Throat.	Deafness.	Pain.		Olfaction dim.	A1. N	A1. F	A2. N
Syphilis .. 125[a]	M	10	7	42	21							mucus 28[a]	14			1
												dry 16	11			
	F	6	4	20	15							pus 22	17			
												crusts 59	48			2
Exanthemata 24[e]	M	7	4				13	2		2	.	mucus 5	0			2
	F	8	5									dry 6	0			1
												crusts 13	0			1
Simple Goitre 73[d]	M	2	4	2		8	23	9	19	4	4	mucus[b] 29	3	3	1[p]	8
	F	20	26	15	4							dry 44	8	8	1	1[pp]
Hypothyroidism 42	M	1		1			10		18	8	3	mucus 11	2	1[•]		2[•]
	F	2	7	2	29							dry 31	18	3	4	4
Relatives have Goitre .. 18	M	3					11	1		1	1	mucus 10	2	2		1
	F	10	3	1	1							dry 8	4			1
Composite "Goitre" Group 133[b]	M	6	4	3		8	44	10	37	13	8	mucus 49	7	6[•]	1	11[•]
	F	32	36	18	34							dry[b] 74	23	11	5	6[pp]
												crusts 8	7			2
Clinically Similar 55	M	15	2	2			27	5	6	3	4	mucus 24	3	3		3
	F	15	16	5								dry 19	2	2[•]		2
												crusts 12	7		1	
Toxic Goitre[k] 26	M	0	2	3								mucus 5	0			2
	F	1	8	8	4							dry 6	0	2		2
Lupus.. .. 15																
Anæmia[k] .. 11																
Miscellaneous 22																
Total[d] 435																

a Including 12 cases of hypertrophy. *b* Including 3 cases of hypertrophy.
e Five of these cases have been counted also in the "goitre" groups.
p One case with pus. • One case with cacosmia. N No fetor. F Fetor.

...or each degree of atrophy, the number of cases (in heavy type) and of cures (in italics). ...nalysis of symptoms and signs.

Degrees of Atrophy.								Treatment.												
A2.		A3.		A4, 5.		Total fœtor.	Perforation septum.	A1.		A2.		A3.		A4, 5.		Totals.			Given.	
N	F	N	F	N	F			Total Cases.	Cured.	Total Cases.	Cured.	Total Cases.	Cured.	Total Cases.	Cured.	Cases	Cured.	Treated	Iodine.	Thyroid
1		3	5		7	12				**3**		**30**		**80**						
		4	2	4	6	8														
		3	2	8	9	11	8													
	2		11	5	41	54	34													
	2	2	1·			3				**4**		**9**		**11**						
1		1	2		2··	4														
	1	1·	2··		9···	12	2													
8	3··	8	2··	1		6		**13**	*5*	**25**	*7*	**29**	*16*	**3**	*0*	**70**	*28*	55	27	28
1···	3··	$12^{\cdot\cdot\cdot}_{p}$	$7^{\cdot\cdot\cdot}_{pcc}$	2		11	2													
2·		4	4··			4		**8**	*6*	**7**	*3*	**23**	*15*	**4**	*1*	**42**	*25*	36	3	33
4	1[c]	12[c]	3	4··[c]		8														
1		7				0		**2**	*1*	**3**	*2*	**12**	*6*	**1**	*0*	**18**	*9*	14	3	11
1	1[c]	1	4^{cc}_{p}		$1^{\cdot}_{p}$	6														
1·	3··	18	6····	1		10		**23**	*12*	**35**	*12*	**64**	*37*	**8**	*1*	**130**	*62*	105	33	72
6···	3·	$25^{\cdot\cdot\cdot}_{p}$	$9^{\cdot\cdot}_{pp}$	5··	1[p]	16														
	2·	1	4·	1		8	2													
3	1	13	2	2		3		**6**	*5*	**7**	*3*	**32**	*18*	**10**	*5*	**55**	*31*	48	10	38
2	1	7·	$3^{\cdot\cdot}_{pp}$	2	2·	6														
		2·	5·		4	10														
2		2		1		0	TOTAL	**29**	*17*	**42**	*15*	**96**	*55*	**18**	*6*	**185**	*93*	153	43	110
2		2				0														

[c] One case with crusts. *d* In addition, there were 38 patients with no nasal abnormality.
[h] Including 4 cases counted in goitre and similar groups. *k* Including 9 cases of hypertrophy and 6 normal.

and fetor there were 7 patients with excess of mucoid secretion but no crusts or pus. The Wassermann reaction was positive in 64 cases, negative in 25.

Exanthemata: 24 cases, 11 males. 5 cases are included which are also included among the "goitre" and similar groups. The sexes are equal, and all the patients belong to the younger age-groups. 11 cases showed severe atrophy, 2 perforation of the septum (the greatest care was taken to be sure that these were not syphilitic), and 13 crusting. Fetor was present in all the cases with severe atrophy, and in all but 5 of the remainder; cacosmia occurred in half the cases in each degree of atrophy, except A2, where there was none. No patient had anosmia. 10 patients had a negative Wassermann reaction. The sinuses were examined in 7, and found infected in 1 only (A2, fetor, mucoid secretion, no cacosmia). Measles was blamed in 8 cases, scarlet fever in 12, diphtheria in 4. (I was not aware until beginning this analysis how important were the exanthemata in this connection. There is no doubt that the group ought to be larger; for example, some of those classed as "clinically similar to goitre" should really appear here, but only those cases are included in which the *patient volunteered* that symptoms dated from such a disease.)

These two groups may be regarded as showing the result of severe destructive lesions on the nose. The age incidences are what one would expect; in the exanthem group the sexes are equal, in syphilis males predominate. In both groups a large proportion of the cases shows severe atrophy, about one-quarter have excess of mucoid secretion, and one-half suffer from crusting in the nose. Anosmia is not seen in the exanthem group, but affects two-thirds of the syphilis group. Cacosmia and fetor are far more frequent in the cases with great atrophy and especially in those with crusts.

If there is a real association between atrophy and goitre, one would expect patients with goitre or similar evidence of thyroid mal-function to show a like

definite symptomatology, age and sex incidence, degree of atrophy, frequency of crusting, fetor, cacosmia, etc. The presence of a simple goitre (with which is included simple thyroid adenoma) is taken as evidence of deficiency in thyroid activity or of the quality of the secretion. But the exact correlation of goitre with atrophy is not clear; a large or old-standing goitre does not imply severe atrophy, nor *vice versa*. In the same way, it is sometimes difficult to assign a given case to "simple" or to "toxic goitre"—the features are intermingled. All that can be claimed is that the presence of a goitre is evidence of some disturbance of thyroid function, and is often associated with nasal disease. The symptomatology, age and sex incidence, degrees of atrophy, and other features of the sub-groups composing this group are shown in the table.

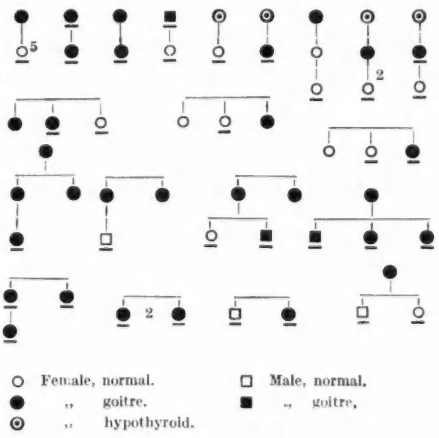
Simple goitre: 111 cases, 12 males. Of these 38 had no nasal signs or symptoms, and 8 complained only of goitre, although the nose was abnormal. 1 patient was gravely anæmic, 2 ascribed the trouble to exanthemata. 5 were already taking thyroid when first seen. In 70 cases showing some degree of atrophy only 3 were classified "severe." 2 patients showed perforation of the septum. Over a third of the cases had excess of mucoid secretion, only 2 suffered from crusting. 17 had fetor, evenly divided between the moist and dry. Cacosmia was more frequent among the dry cases, but neither fetor nor cacosmia was much more common in the more severely atrophic than in the less. 6 had negative Wassermann reaction.

Hypothyroidism (including 5 cases of classical myxœdema): 22 patients, 2 males. 7 of these were thus classified on account of amenorrhœa, etc. In 2 cases the complaint followed an operation for simple goitre. Only 4 showed severe atrophy; none had crusting or cacosmia, but 6 had fetor. Wassermann reaction negative in 8.

Menopause rhinitis: 20 females. The distinction between these cases and the last was in many cases very doubtful,

and the two are shown as one sub-group. One was gravely anæmic, another blamed pneumonia as the origin of nasal disease. In 3 patients the menopause was due to surgical measures. 3 patients showed severe atrophy, none crusting, 6 fetor. Wassermann reaction negative in 5.

Relatives have goitre : 18 cases, 3 males. One patient was gravely anæmic, in 3 nasal disease was ascribed to exanthem. Wassermann reaction negative in 6. Only 1 patient had severe atrophy, 3 had crusting, all with fetor, and 3 others also had fetor ; more than half the cases had excess of mucoid secretion, and none of these had fetor. Only 1 patient (A5 : pus) had cacosmia.



Relationships in cases of goitre, hypothyroidism and rhinitis. Cases of rhinitis are underlined.

FIG. 2.

This group shows a less direct connection with goitre, but is inserted owing to the frequent familial tendency in goitre, the assumption being that a defect which is expressed in one member of the family by the appearance of a goitre in another shows as nasal atrophy. In addition to those actually shown in this group many patients in the goitre group were relations,

as mother and daughter, sisters, etc. The actual relationships noted are shown in Fig. 2. In no less than three instances we find grandmother with myxœdema (or hypothyroidism), mother with goitre, daughter with rhinitis. This group also affords strong evidence that the "goitre" type of rhinitis is a definite clinical entity, for in each of the three following cases the diagnosis "endocrine rhinitis" was made before the appearance of the goitre in a relative afforded confirmation :—

Case 1.—Female, aged 6 years. Seen early 1931 ; diagnosed "endocrine rhinitis" : A2, excess mucoid secretion, olfaction normal, complaining of "catarrh" ; no fetor, no cacosmia. Inquiry as to goitre in mother negative. Put on thyroid for eighteen months, then ceased treatment as "cured." Brought up for examination in January, 1934, by her father ; the child was quite well, but the father was seen to have a large goitre and typical rhinitis.

Case 2.—Female, aged 6 years. Seen March 1928 ; complaining of catarrh for two years : A3, crusting, fetor, Wassermann negative, antra normal ; no goitre in family. Ordered thyroid in January, 1929, for thirteen months, then "cured." Normal in March, 1933. Called up for examination January, 1934, and found normal ; brought with her her small sister *aged 3 with a large goitre*, but no nasal symptoms.

Case 3.—Female, aged 9 years. Came late in 1926 complaining of smell from the nose during two years : A3, crusting, anosmia, fetor, no cacosmia ; no goitre in family history. Put on iodine for four months ; improved, ceased to attend. Returned in January, 1933, with atrophy, but no fetor ; put on thyroid. January, 1934, no atrophy, no fetor, no symptoms ; came with her sister, who had been under treatment for goitre for four years.

Grouping together the last four sub-groups in which there is a more or less direct association of atrophy with goitre or other signs of endocrine mal-function, we have here a composite group of 131 cases, of whom only 13 are males. This is what one might expect

in a condition associated with goitre. So, also, we might predict the large proportion of patients under thirty, which is still more conspicuous if the menopause group is neglected. Atrophy is rarely severe: the classification being mild in 23 cases, definite in 35, well developed in 63, and severe in only 8. One would expect the lesser degrees of atrophy to be the more common; possibly some of the milder cases are overlooked, but probably patients often do not come for advice until a certain stage has been reached. But no degree of atrophy that is seen in syphilitic or other groups is absent here. Rather over one-third of cases (37) have excess of mucoid secretion, only 5 have pus, 6 show crusting, and the remainder, over half, show only an abnormally dry mucous membrane (half of which in each sub-group have small scabs on the surface in addition). Olfaction is diminished or lost in one-third, the "dry" group being far the most affected, especially among those with the more advanced atrophy. The distribution of atrophy, crusting and other features between the fetid and non-fetid groups is shown below, the corresponding figures for the syphilitic and exanthem classes being shown for comparison. In the group we are now discussing the fetor is generally a faint "sourish-albuminous" smell with a tendency in some patients to be much more pronounced just before the menstrual period; it does not affect the "dry" more than the "moist." Where crusts or pus are found the severe fetor "typical" of atrophic rhinitis is usual. Cacosmia is commoner among the fetid than among the non-fetid (even though the former have nearly all lost the sense of smell), but is not specially prevalent with the extreme degrees of atrophy.

	Syphilis.		Exanthemata.		Endocrine.	
	No fetor.	Fetor.	No fetor.	Fetor.	No fetor.	Fetor.
Cases	42	83	5	19	101	32
Extreme atrophy ..	17	63	0	11	6	1
Perforation	5	37	0	2	0	2
Crusting	5	54	1	12	2	6
Cacosmia	11	47	1	8	8	10
Anosmia	23	67	0	0	9	28
Excess mucus	4	12	3	2	20	6

One may summarize the special features of this group of cases by saying that the patients are nearly all females, mostly below 30, although cases tend also to occur following the menopause. They complain usually of "catarrh" or dry throat, rather less frequently of deafness, fetor or simply of "goitre" without reference to the nose; occasionally of headache, nasal obstruction, etc. The usual findings are (1) a well-developed, but seldom severe, atrophy in which the lower part of the nose is chiefly affected, so that one can look right back into the naso-pharynx, while the middle turbinals stand out conspicuously near the septum in the upper part of the nose; (2) a nasal mucous membrane pale, thin and generally abnormally dry, often with small scabs on the surface, or flooded with thin, milky-watery mucoid secretion, only rarely showing crusts or pus; (3) about one-third of the patients exhibit fetor, which has usually a definitely "mucous" character, and is seldom severe except just before the menstrual period, but may be the typical offensive fetor known as "ozœna" if pus or crusts are present; (4) many of the patients with

fetor are unconscious of it, having lost the sense of smell; (5) the posterior wall of the pharynx is thin, often dry, and may show a film of drying mucus on the surface or a blob of thick mucus is extruded behind the soft palate when the patient gags; (6) there may be other evidence of diminished endocrine activity; (7) there is no evidence of syphilis, and the nasal sinuses are generally healthy; (8) there is a rapid improvement on administering thyroid substance or iodine.

Thirty years ago and later a great deal of experimental and clinical work was done on the subject of ozœna (which was by many regarded as a definite disease), with a view to showing that a specific bacillary infection (*e.g.* with the bacillus of Perez) or an attenuated diphtheritic infection was the causative agent. The tendency for women to be chiefly affected, and for the condition to attack more than one member of a family was recognized, and we have shown above some evidence of the influence of diphtheria. But it is now generally admitted that the crusting and ozœna are the consequences and not the cause of the atrophy, and all my clinical observations go to support this thesis. In particular, exactly similar crusting, atrophy, and ozœna can be produced by the action of radium, or by injudicious surgical measures, especially removal of the inferior turbinal—the most certain means of inducing permanent atrophic rhinitis. There is, indeed, hardly any one clinical feature that can be called characteristic of "endocrine" atrophic rhinitis which is not seen also in syphilitic and post-exanthematous cases.

I may cite here the cases of two young women whom I treated for many weeks with glucose applications in 1922–23:

they suffered severely from crusting and ozœna, but although temporarily benefited by the treatment, abandoned it as too tedious. One I saw again in 1929, the other in 1933; both had the same extreme atrophy, but in each case following the birth of a child, which presumably effected a profound change in endocrine functions, the crusting and fetor entirely disappeared.

This being so, the diagnosis must rest largely on the exclusion of syphilis, on the age of the patient, the general clinical picture described above, and particularly on the response to treatment. If there is also clear evidence of endocrine mal-function in the patient or her immediate relatives, this is strongly confirmatory. Perforation of the septum should make the investigation of syphilis very stringent; on the other hand, atrophy in a child under ten or twelve should not be considered syphilitic without quite definite evidence elsewhere.

The diagnosis and treatment of these cases is important, particularly in the young, many of whom are sent up for tonsillectomy on account of "catarrh" or deafness, and complain of "sore" throat when only excessive dryness is meant. For not only does tonsillectomy not improve the symptoms, but the tendency to dryness is often accentuated by the operation, which is blamed for it—with a certain show of reason. I believe that the deafness is often not due to infection via the Eustachian tube, but is a consequence of participation in the atrophic process by the mucous membrane of the middle ear; at least, in a number of cases this symptom has been relieved by treatment with thyroid gland substance without local treatment of the ear.

A number of patients have been classified as "similar to goitre" on the clinical appearances in

the nose. This group consists of 55 patients, 19 males. There is no doubt that some of these ought to have been grouped with the "exanthem" group, and the features shown by the group as a whole are a blend of those of the exanthem and goitre groups. For example, crusting and severe atrophy are more common than one would expect with the latter. Other points are indicated in the table; this group has been included mainly because the similarity of clinical appearances led to treatment on the same lines as for the goitre group, and the results are worth recording for comparison.

The group described above as "endocrine rhinitis" is one in which there is (*a*) goitre or evidence of endocrine insufficiency, and (*b*) a tendency to nasal atrophy. By way of contrast a small group of cases has been separated in which the patients suffered from toxic goitre, Graves's disease or toxic thyroid adenoma; to these may be added 2 cases of myxœdema who had been taking large doses of thyroid for many years and 1 patient who came up complaining of dyspnœa—she was taking three grains of thyroid extract daily and was cured on halving the dose. There are 26 patients, 6 males. Rather more than half are over 30. Although there was excess of secretion in only 9 cases, yet of the whole 26, 9 patients showed *hypertrophy* of the nasal mucosa, 6 had no atrophy, 2 mild, 4 definite, 4 well-marked and only 1 severe atrophy. No case showed fetor, cacosmia, crusting, pus or perforation. In other words, this group shows an exactly opposite tendency in the nose towards excess function, and affords complementary evidence to support the association claimed between simple goitre and atrophy.

Before leaving the subject of clinical features a word must be said about infection of the nasal sinuses. It is remarkable how seldom these are infected, especially in the more severe cases of atrophy, although one would expect that with the nose full of abnormal secretions, pus or crusts their infection was almost certain. In the combined goitre group 29 cases were examined, only 7 were infected (and 4 of these had fetor). In the clinically similar group 18 cases were examined, 3 found infected (2 with fetor) That is, among 47 cases examined, which we may assume were practically all those in which the least likelihood of infection appeared, only 10 were infected, and among these it is probable that in 7 the sinus infection was responsible for the fetor. In 11 cases in all it was noted that the sinuses were remarkably smaller than normal ; whether this indicates some congenital abnormality, which may be part of an early failure in nasal development (and associated in this way with a tendency to nasal atrophy), or an early infective or other influence retarding development of sinuses and perhaps nose also, one cannot say.

Treatment.—A discussion of the causes of atrophic rhinitis would be merely of academic interest unless it led to a useful method of treatment. The treatment of this condition has been generally unsatisfactory. Some surgical methods aim at mechanical narrowing of the nasal passages by forcing together the maxillæ or by implanting cartilage into the turbinals, etc. The latter method has the defect that often it is difficult to discover anything but vestiges of the turbinals ; it was applied in 6 cases of the " goitre " and " similar " groups with a fair measure of success,

and to 7 of the syphilitic with very little. Many methods of treatment aim either at stimulating the mucosa by local applications or merely at cleansing the nose of crusts and secretions; they succeed only as long as they are being applied, and are both tedious and comparatively unsatisfactory; nevertheless, they are the only resource in a large number of the worst cases.

During the seven years nearly all the cases of the "goitre" and "similar" groups have been treated by administration of iodine or thyroid by mouth. The iodine preparation usually favoured has been the "Liquor Iodi Simplex," from two to ten drops in milk or coffee twice or thrice daily; for a child of 10 five drops twice daily has been an average dose, for an adult thrice daily, but the dosage needs to be regulated to the clinical effect, and often has to be reduced after a few weeks. 28 patients were treated thus in addition to a few who had thyroid in addition, 2 who received potassium iodide, and 7 on Lugol's solution.

The dosage of thyroid has been even more varied, but most children of 10 can take half a grain daily of "Thyroid B.P. 1932" at least, and adults somewhat more; the aim has been to give as large a dose as can be taken without producing signs of excitement; several patients could not take even minute doses, but had to be treated with iodine. In the hypothyroid group 7 patients received "multigland" preparations and two thyroid with ovarian substance; including these, 110 patients were treated with thyroid (apart from those whose treatment has been too recently started for results).

Whichever treatment was adopted, regular clinical inspection has been made every two or four weeks,

in most cases for at least six months, in many for three years. Children have responded better than adults. No nasal douche has been allowed, except in the few cases where there were actual crusts, and then only as long as these made douching necessary. In many cases where the nose was very dry an oily spray was ordered during the early stages. As a deodorant, and also where there was much excess of mucoid secretion, a snuff composed of menthol one part, lactic ferment nine parts, lactose ninety parts has been much appreciated — 3 patients received the snuff without other treatment. The results of treatment are shown in the table.

Of the 188 patients in these groups 17 have started treatment too recently for observation; 6 who were ordered treatment did not receive it; 110 were treated with thyroid gland, a few having iodine in addition; and 43 were treated with iodine in some form or other; the remainder were treated in other ways or received no treatment. Of the 153 treated with iodine or thyroid 19 are untraced, 34 are not improved and 7 are definitely improved but not cured; 93 are cured—most of these have been seen within the last three months, and it is fair to mention that a considerable number remain under treatment although "cured," a few (not re-examined) have reported that they remain free from all symptoms. The table shows the proportion of cures in various groups. Naturally this is greatest in the group with mild or trivial atrophy, but the proportions are not very dissimilar in the more advanced cases, and (to my astonishment) 6 of the 18 cases with originally severe atrophy are now without atrophy or other symptoms. It is curious that the "goitre" group

shows the worst response to treatment, probably because fewer patients in this group were treated with thyroid gland than in the others. About sixty per cent. of all the patients in each sub-group who received thyroid, etc., have been relieved of all nasal symptoms: this supplies the most convincing support to the thesis that the nasal condition in these patients is directly associated with a defect in thyroid secretion.

FOCAL INFECTION.*

BY

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IT would seem advisable, as a first step, to define what I mean by focal infection. However desirable this may be, I find it difficult to do so, as the more one considers the subject the less capable of definition does it appear to be. As a basis, however, for these remarks I suggest that by focal infection I mean chronic disease in organs or tissues of the body directly resulting from a centre or centres of infection situated at a distance. This definition, no doubt, lacks scientific precision, but so does our knowledge. That much chronic disease is due to focal infection I firmly believe, but my purpose to-night is not to attempt to convert the unbeliever. Instead, I propose to place before you, by briefly relating illustrative cases, what I believe to be important points in the application of this principle to practice.

My first illustration represents the type of case in which an obvious infective focus exists, but owing to its not having been looked for irreparable damage has been done.

* A paper read before the Bristol Medico-Chirurgical Society on Wednesday, 14th March, 1934.

The patient, a woman aged 69, gave a history of chronic conjunctivitis and dacrocystitis of many years' standing. In addition she had an anterior polar cataract in one eye and commencing changes in the vitreous of her other, and only useful, eye. When questioned, she also gave a history of chronic sore throats for at least fifteen years, with left frontal headaches for about the same period. Examination disclosed a chronic suppuration in the left antrum, secondary to an old buried tooth fragment, and drainage of the antrum with removal of the tooth has resulted in some improvement in the vision of her seeing eye.

In contra-distinction to the case just quoted, in which the focus, when looked for, is very obvious, I should wish to illustrate a not uncommon type in which the opposite obtains, and in which the focus, far from being obvious, requires perhaps to some extent the eye of faith to recognize it. As an example of such a case, in which serious secondary results have followed a barely discoverable infective focus, I cannot do better than quote the following :—

A woman, aged 32, had suffered for some months from a pustular eruption on the face. When first seen, nearly eighteen months ago, she gave a history of progressive œdema of a few weeks' standing, the urine being solid with albumen. Careful investigation of the medical history disclosed nothing beyond a vague history of occasional sore throats, in no case sufficiently severe to lay the patient up. Superficial examination of the pharynx revealed nothing abnormal, but retraction of the anterior pillars disclosed small and somewhat unpleasant-looking tonsils. Removal of these has resulted in complete resolution of both the nephritis and the dermatitis.

Seeing that the focus of infection is frequently so difficult to identify, it is not surprising that one sometimes makes a mistake as to its situation. As an example of such a mistake of my own I will quote the following :—

The patient, a man aged 27, had suffered from recurrent attacks of iritis for three years, accompanied by a general neurasthenic condition.

Eighteen months ago I operated on his nasal septum, on the mistaken assumption that the iritis was secondary to a nasal infection. Six months later he developed a quinsy which was immediately followed by an attack of iritis, and after this there was a succession of sore throats followed on each occasion by a flare-up in the eyes. His tonsils were removed four months ago, and as to the result I cannot do better than to quote from a letter I recently received from him: "I can honestly say that ever since the operation I have never looked back, but have got slowly and steadily better every day and in every way. The eye attacks have each time become less, the wretched 'back of the neck' pain has been gradually becoming less until the last three weeks it has entirely gone, my energy is trebled, I have gained 12 lbs. in weight, the things I used to worry about no longer worry me—in other words, I have changed from a nervous wreck into a person that is full of energy and ready to battle with the next emergency."

In this case I have no doubt that the tonsillar infection was the primary one. As a result of experience I am now of the opinion that where one is in doubt as to the relative blame of possible foci in the nose and throat, the tonsils are by far the most frequently blameworthy.

Another somewhat similar case is the following:—

A male, aged 52, when first seen nine years ago was suffering from a chronic infection of the skin and subcutaneous tissue of the face, which he stated he had had for twenty years. His antra were dark on transillumination, and I then regarded the skin condition as being probably secondary to a chronic antral suppuration. Exploratory puncture, however, proved negative, and I did not see him again until six months ago. I then found him to be in much the same condition, but in light of further experience I paid more attention to his throat, and found that he had enlarged and obviously grossly infected tonsils. Removal of these has resulted in a rapid clearing up of the skin infection. In my experience chronic skin infections are much more frequently met with in association with infection in the tonsils than in the nose.

A not uncommon happening is to observe a case in which an infective focus is discovered and dealt with surgically with improvement in the secondary lesions, to be followed, however, at a later date by evidence of the arising of another focus of infection followed by a recrudescence of the secondary lesions.

As an example of this occurrence of consecutive foci, a female, aged 44, was seen five years ago with a history of nasal discharge of some years' standing, associated recently with severe muscular rheumatism. Drainage of infected nasal sinuses caused a complete clearing up of the rheumatism, with considerable improvement in the general condition. Four years later, however, she had an attack of acute tonsillitis, which was followed by a recurrence of the rheumatism. Removal of her tonsils has resulted in improvement in her general condition and rheumatic symptoms, but the operation has been performed too recently to judge of the final result.

Not uncommonly, however, instead of one focus following another, we find that multiple infective foci are present from the beginning, and the discovery of one may prevent a search being made for another which may be of even greater importance.

This is exemplified by a woman, aged 42, who fifteen years ago was affected with septic arthritis of relatively sudden onset. This was presumed to be associated with infected teeth and these were dealt with, with perhaps some degree of improvement, but the patient remained more or less an invalid. The occurrence of an otitis media a year ago led, as a routine, to the examination of the nose. To my surprise I found on transillumination that the antrum on one side was completely opaque. Operation disclosed chronic disease in the antrum, which from its nature had almost certainly resulted from a dental infection many years previously, and a recent note of her condition states that she is now fit, fat and well. Some deformity of the joints remains, but no sign of any active disease.

One of the most difficult classes of case with which

we have to deal is that in which allergy, hypersensitiveness, or whatever term one uses, appears to be a pronounced factor. This, at present, somewhat nebulous portion of the machinery of the reaction of the body to infections seems to be obtaining an increasing share of attention.

As an example of such a case, I quote a male, aged 47, whom I first saw eleven years ago for a slight nerve deafness, tinnitus, and attacks of sneezing and watery nasal discharge. This condition persisted in spite of vaccines and other treatment for seven years, when removal of infected teeth was followed by an entire disappearance of the nasal symptoms. For a year before the teeth were dealt with the patient had, in addition, an arthritis of the wrists, feet and ankles. Removal of the teeth was followed comparatively rapidly by the disappearance of the nasal symptoms, and the arthritis also cleared up, but not for an interval of about a year. This patient, who is a schoolmaster, and in spite of this is of an unusual grade of intelligence, tells me that he now has simply some slight residual stiffness of the joints, that he gets hay fever every summer, and that, curiously, the ingestion of either spinach or tomatoes is invariably followed by some recurrence of pain in the joints. Here we have, it seems to me, an individual who is constitutionally hypersensitive to many substances, including the products of focal infection around his teeth. In such a case the hypersensitiveness is far from being a contra-indication to the removal of an infective focus, but is rather the reverse. The case also illustrates what I believe to be a very important fact in deciding the prognosis in cases of focal infection. This fact is that one must let at least a year elapse before one can judge as to how far removal of the focus may have altered what are believed to have been secondary lesions.

A considerable amount of evidence is accumulating to suggest that derangements of the endocrine system are not infrequently due to focal infection. Among such, affections of the thyroid gland may be associated with a focus of infection which, in my somewhat one-sided experience, is usually tonsillar. In the

discussion at the last meeting, the question was raised as to whether in a case of focal infection with a secondary thyroid derangement, the former or the latter should receive surgical attention. I would certainly agree that in cases presenting much evidence of toxicity the thyroid claims priority. On the other hand, although my experience is very limited, I believe that if attention to the infective focus is given at an early stage, the thyroid lesion will be checked.

As an example of this, a woman, aged 23, following a double quinsy preceded by frequent sore throats, developed some enlargement of the thyroid with some slight degree of toxicity and loss of weight. Removal of her tonsils has resulted in a decrease in the thyroid enlargement and an increase in the woman of one and a half stone!

As another example of the effect of focal infection on the endocrine system I should instance the case of a woman, aged 34, who was seen some two years ago with enlarged and obviously infected tonsils and a history of recurrent iritis. She had also put on a considerable amount of weight, and was lethargic and irritable with loss of sexual impulses. Following tonsillectomy she has become a changed individual. The trouble in the eyes has cleared up, she has lost two stone in weight, she has become active and cheerful, and her sexual life is now normal.

Finally, two examples of the changes which may be produced in the nervous system by what is apparently a relatively innocent infection.

A male, aged about 47, and in a very responsible and rather worrying position, had felt tired and depressed with headaches for the best part of a year. In spite of prolonged rest, no improvement took place, and so serious was his condition that it seemed probable that he would have to give up his work. Thorough investigation disclosed no organic lesion beyond a doubtful degree of dental infection associated with crowned teeth, etc. Radical dental treatment resulted in complete recovery, and the individual is now fitter in every way than he has been for many years.

As an example of the effect of focal infection on a peripheral nerve, in contra-distinction to the central nervous system, I should like to illustrate a case in which the auditory nerve was the one to suffer. We all appreciate that the auditory nerve is relatively easily damaged. We expect it to degenerate early as a result of age changes, and we find that it is easily affected by chemical substances circulating in the blood, *i.e.* such drugs as quinine or salicylates. Cases of unexplained nerve deafness are, I believe, not infrequently to be explained as resulting from the toxic effects of a focal infection. What was to me a dramatic illustration of this is presented by the following case :—

A male, aged 52, was first seen by myself twenty-one years ago, and has been seen at odd intervals ever since. His hearing during the last ten years had gradually depreciated owing to a nerve defect. Some eighteen months ago I suggested that he should have his mouth, which was obviously infected, put in order. I did not see him again until recently, when, to my surprise, I found that his hearing had recovered to a degree which brought it back to what it had been some ten years previously. Apart from the removal of his infected teeth, I discovered no other possible factor which could have produced this improvement.

To sum up. If one is a believer in focal infection, as you appreciate that I most surely am, it is of paramount importance in this, as in other branches of medicine, that examination should be thorough if mistakes are to be avoided. In the majority of cases there is, at present, no satisfactory alternative to dealing with the focus surgically. In regard to this it is perhaps of interest to quote from the report of the British Medical Association Committee on arthritis. They state that surgical treatment of an infective focus may fail because it was not the guilty

one, because another focus may exist, such as an endocrine one, following a tonsillar or dental one, because a state of hypersensitiveness may persist, or, finally, I suggest, but they do not, because the removal of the focus has not been carried out sufficiently early in the history of the case, *i.e.* before the secondary results have become too firmly established to clear up.

THE DIAGNOSIS OF SWELLINGS OF THE LONG BONES, WITH A CASE OF PERIOSTEAL SARCOMA OF THE FEMUR.*

BY

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THIS communication owes its inspiration to the repeated anxieties which the author has felt when trying to elucidate the nature of bony swellings. The problem seemed almost insoluble in the case of femoral sarcoma now reported. It recurs frequently among the cases cited as illustrations of the differential diagnosis. In the handling of this every-day difficulty the patient's good and the reputation of the medical profession are seriously at stake.

OSTEOGENETIC SARCOMA OF THE FEMUR.

Case Report

M. N., a female, 9 years old, came into the Bristol Children's Hospital in June, 1931, complaining of pain in the right hip for one month: there had been a previous attack lasting a fortnight a year before. Examination revealed a tender fulness which could be seen and felt below the great

* A Paper read at a Meeting of the Bristol Medico-Chirurgical Society on Wednesday, 11th April, 1934.

trochanter of the right side. The circumference of the thigh was $\frac{7}{8}$ in. less than that of the left side. She walked with a slight limp.

Skiagraphy, a month previously, had shown the cortex of the right femur, below the great trochanter, to be evenly thickened to twice the thickness of that of the left side. On a skiagram taken 14th June, 1931, Dr. Mayes reported: "Old inflammatory condition of great trochanter of right femur. The shaft shows periostitis . . . the condition appears to be quiescent." (Fig. 1A.)

Operation.—An exploratory operation 16th June, 1931, revealed an unduly cancellous bone mixed with a jelly-like material.

Biopsy Report.—"The appearance suggested to my mind the possibility of remote trauma, with subsequent repeated hæmorrhages and insufficient absorption. There are a few blood-vessels, however, showing intimal changes and collars of monocytic cells."

Septic discharge followed the operation for one week, but the wound healed well and after three weeks she left the hospital walking well.

Pain recurred, however, and disturbed her rest. A further examination showed an obvious, spindle-shaped swelling below the great trochanter. This was again explored on 29th September, 1931, and specimens sent to two pathologists.

Report A.—"Shows evidence of simple chronic inflammation."

Report B.—"I find little that is abnormal. There is certainly no evidence of neoplasm."

During the following autumn slight pyrexia and pain continued, and the circumference of the limb increased in size from 14 in. (12th November, 1931,) to 15 in. (10th December, 1931) despite two injections of colloidal selenium given on 18th and 25th November, 1931. The Wassermann reaction was negative, even after a provocative injection of novarsenobillon. The only abnormality found in a differential blood-count was a rise in small lymphocytes to 42 per cent. As she was well in other respects and the disease was progressing a diagnosis of sarcoma became compulsory. I was glad to have the help of Mr. Harry Platt's opinion at this juncture, and with his encouragement to amputate.

PLATE I.

FIG. 1A.
Femur, sarcoma (M.N., 9 years).

FIG. 1B.
Femur (M.N.), section after removal.

FIG. 2.
Humerus, septic periosteal node and abscess.

FIG. 3.
Radius, syphilitic osteitis.

FIG. 4.
Femur, osteolytic sarcoma with spontaneous fracture.

FIG. 5.
Radius, sclerosing sarcoma.

Operation.—15th December, 1931. Under a spinal anæsthetic, disarticulation at the hip, followed by a blood transfusion. Satisfactory convalescence. Pathological report on specimen after operation: "Sclerosing osteogenetic sarcoma."

Present condition.—11th April, 1934: She is a happy, bonny girl, with no signs of recurrence.

Before considering the special problem of the foregoing case it is useful to take a wide survey of the whole subject of this paper. To clarify the study a simple pathological classification has been adopted.

DIFFERENTIAL DIAGNOSIS.

1. *Traumatic Osseous Deposits.* — Among the swellings on a long bone those due to trauma provide many traps for the unwary. In the foregoing case there was a vague history of injury, and the smooth, osseous node below the great trochanter might have passed for traumatic periostitis. Indeed, one distinguished London surgeon did so diagnose the skiagraphic picture. In another instance a hard mass at this very site proved to be of a simple nature.

A docker, aged about 50 years, came some weeks after a blow on the hip with a hard, tender area the size of a child's fist and arising rather abruptly from the right femoral shaft just below the great trochanter. Skiagraphy showed bony flecks in the soft parts, overlying the femur. Fortunately, though bruising was no longer visible by the time I saw him, the history of injury was sufficiently clear to justify the belief that there was no osteo-sarcoma but myositis ossificans present, and time confirmed this.

The occasional occurrence of sarcoma following a clearly-established history of bony injury increases

the need for caution in giving an opinion. A fear of sarcoma may arise from a swelling due to a slow growth of callus around the site of an ununited crack across the tibia, especially if the patient first consults his doctor many months after injury. The delusion is quickly dispelled by radiography and the disability by a walking plaster.

The tendency for myositis ossificans to follow particular injuries often greatly aids diagnosis. For instance, when a hard mass develops after fracture or dislocation at the elbow and skiagraphy shows a bony shadow along the front of the humerus, there is no need to think twice about the underlying nature of the trouble. Again, the common tender and hard swellings that develop in front of the thigh after severe injuries to muscle or bone give rise to little anxiety as regards their pathological significance. They are apt to correspond in extent to the anatomical outlines of the quadriceps, and long strips of bone seen in the lateral skiagram parallel to the femoral shaft are characteristic. With rest their reduction slowly becomes apparent.

In regard to the nomenclature of this condition Watson Jones and Roberts[1] offer valuable criticism. They state that the term "myositis ossificans" is misapplied to these traumatic osseous deposits. They are really due to ossification in hæmatomata formed between the bone and the periosteum that has been stripped up. The correct name is "ossified periosteal hæmatoma," while myositis ossificans should be reserved for cases in which myositis is present.

In doubtful cases of sarcoma it may be necessary

to resort to exploration. Such biopsies are very responsible undertakings. The weighty decision for or against amputation may have to be made more on the naked-eye evidence at this time than on the later histological findings, which are liable to be inconclusive in bone tumours. Boyd[2] quotes Ewing's warning on bone biopsies, which states: "The more experienced the pathologist the more he learns to rely on clinical data for clinical diagnosis, and the more he urges the surgeon to make his diagnosis on clinical observation and not to expect too much from the study of small pieces of tissue."

2. *Sepsis.*—As a rule septic infection gives distinctive evidence of its presence, yet sarcoma may mimic it. Thus the case of M. N. shared some of the stigmata usual in sepsis, such as a trace of fever and temporary discharge following exploratory operation, but no leucocytosis was present. On rare occasions sarcoma may closely simulate even acute pyogenic invasion of bone.

In 1923 a lad of 15 years was sent urgently by his doctor with a shin that was red and tender. The leg had troubled him for a month, and for a week he had had severe pain and a temperature of 100°. Acute infective periostitis seemed certain from the appearance.

I incised the periosteum and explored the bone, but found no obvious disease, nor did the pathologist's report on the bone-marrow help. It stated: "The tissue is bone and marrow; the marrow shows hæmorrhages and excess of polynuclear leucocytes. A few doubtful gram positive cocci are present; they are too few for certainty."

Two rigors occurred during his stay of a month. Four months later he returned after terrible suffering with a considerable increase in the size of the limb and a discharging sinus. Sarcoma suggested itself, for on exploration the tissue had a ground glass appearance and cut like gristle. Still the

pathologist reported : " Chronic irritation, somewhat suspicious of syphilis." Some surgeons even at this advanced stage had favoured a diagnosis of chronic infective osteitis. On excavating deeper, bony tissue was removed, and after examining this the pathologist reported : " Osteosarcoma."

The leg was amputated ; he worked comfortably for two years, and then recurrent pain and metastasis began, of which he died two years later.

The contrary may happen, and what suggests sarcoma to the doctor may happily turn out to be sepsis.

A mother of 35 years, shortly after the birth of her baby, developed a hard swelling difficult to define deep on the lower end of the femur with mild fever. There was a history of injury in infancy and a small scar, but the woman had known no trouble since. The skiagram showed a small area of rarefaction in the adjacent femur.

At operation a few ounces of pus escaped, and a surprisingly extensive sequestrectomy of the lower third of the bone was needed.

This case also usefully illustrates the astonishing period of latency associated with osteomyelitis. The skiagram of L. M. (Fig. 2) affords an example of a dense surface node developed around a pyogenic infection in subperiosteal bone. Local excision cured it.

Owing to a septic metastasis in bone a spontaneous fracture may occur, and when the clinical picture corresponds with that in sarcomatous cases it may for a time mystify the doctor.

A man of 28 years broke the shaft of the right humerus by merely holding the rail of a tram car from which he was alighting in the usual way. Great swelling and discoloration was present when the arm was seen a day later and suggested a sarcomatous basis for the spontaneous fracture. The skiagram showed a break, but no disease.

In time the nature of the underlying lesion proved to be chronic pyæmia. He died eight months later from uræmia, after continual attendance for dressings of a chronic sinus. The post-mortem revealed multiple renal abscesses.

It is instructive to compare this with the following story :—

"A young woman attended my out-patient clinic with a fractured shaft of the humerus. A day or two before she felt her arm snap as she was getting over a stile. The skiagram showed nothing beyond a simple oblique fracture, but within a week the limb, instead of diminishing in the usual way, became increasingly swollen and painful. The condition was obviously sarcomatous. She refused amputation, and the arm was the size of a thigh before she died of pulmonary metastases months later."

3. *Tuberculosis.*—Tuberculosis, too, is often a close mimic of sarcoma, and both, like sepsis, are found most often at the ends of the bones in the active vascular area of the metaphysis.

When a child limps it may be only with difficulty and after two and three examinations that it is possible to assure oneself of the presence of a firm swelling in the bone adjacent to one of the joints. The skiagraphic evidence is apt to be slender and inconclusive at this equivocal stage, and may show a slight excavation or hint of periosteal roughening of the bone. The temperature is usually not raised, but there is help from the age incidence, for tuberculosis is frequent in the first decade, whereas sarcoma in a limb usually appears in adolescence or later. When faced with this common diagnostic dilemma the expectant line of treatment is best. Record the character of the swelling, circumference of the limb, and place it at rest. A tuberculous case usually

declares itself either by amelioration of the symptoms or, if progressing, by softening of the swelling, the appearance of further foci about the skeleton, or obvious characteristics in subsequent skiagrams. Sometimes sarcomatous disease of the end of a long bone is called "chronic tuberculous arthritis." The mistake is as easy as it is deplorable to make. There is chronic, insidious pain followed by muscle wasting, stiffness of and a swelling so near the joint that the condition clinically is easily labelled "tumor albus."

4. *Syphilis.*—Gummatous osteitis and periostitis may bear a close resemblance to sarcoma owing to the severe chronic pain and swelling. Whereas with sarcoma the tumour rises abruptly from the shaft, in gumma the normal bone blends rather imperceptibly. The skiagram shows a less discrete localized disturbance than is usual with sarcoma. (Fig. 3.) In doubtful cases a Wassermann reaction is needed; and if positive should be followed by the therapeutic test with potassium iodide, for the patient may be the victim of both maladies.

5. *Swellings on Joints and Tendons.*—On two occasions bursitis over the upper end of the tibia has given rise to difficulty in diagnosis. In the first case, at operation, the negative skiagram was confirmed by the finding of a simple subsartorial bursa. This was in a seaman of some 50 years. In a girl of 17 years, with this bursa (as proved at a second operation), sarcoma of the underlying bone was the root of the trouble. Deceptive features in the latter case were (1) the ready withdrawal of 20 c.c.'s of typical

clear synovial fluid which was found normal by the pathologist, and (2) after a first operation a biopsy report of "much inflammatory osteitis." A similar swelling in another lad, who was a chronic asthmatic invalid, was dissected out cleanly and proved to be tuberculous.

Fibro-sarcoma of a tendon sheath is sometimes found ominously hard and fixed as if arising from the bone itself. Twice I have met with such a mass, projecting from and as large as the medial condyle of the tibia, and once in connection with a finger flexor tendon. Osteo-arthritic nodules in the front of the hip-joint or subpsoas bursa provide deep-seated, hard swellings suggestive at times of sarcoma. A skiagram in the former case, or needle aspiration in the latter, reveal the truth of the matter.

6. *Non-sarcomatous Tumours of Bone.*—The foregoing are the genuine stumbling-blocks in the diagnosis of swellings on a long bone, and thanks to the superb radiography of to-day they are fewer than formerly. Osteoma, chondroma and solitary fibrocystic disease always have distinctive appearances in skiagrams, and from a practical point of view need seldom cause anxiety in diagnosis Solitary myeloma, whether giant or plasma-celled, tends to expand rather than project from the bone. The thinned shell of bone often breaks spontaneously and skiagraphy is typical. In diffuse myelomatosis it is to be noted that the disease may be confined to one tumour for the first year or two, and that the characteristic Bence-Jones proteosuria is absent in a considerable percentage. In a case of pathological fracture or paraplegia in

older folk secondary malignant deposits need to be borne in mind.

7. *Rheumatism.*—Some cases have come to me labelled rheumatism or sciatica which have proved to be sarcomatous. Since in its early months a deep-seated tumour may give no evidence of swelling, but merely aches and pains, the condition may resemble rheumatism. The patient, too, usually has a healthy record and looks otherwise well, which further tempts the clinician to affix this common diagnostic label. Once such a conclusion is reached there is a dangerous tendency for it to put an end to fresh cogitation on the underlying cause when the patient returns for more of the medicine that has not yet cured. Therefore, when rheumatism resists medication and continues in one place, the doctor should be ever mindful of this most menacing possibility; mention of which seems justifiable, although pain and not bony swelling is the symptom concerned.

8. *Sarcoma.*—Proceeding to the study of sarcoma, as exemplified in the case reported, the clinician encounters the further complication of multiplicity of type of this tumour. As there are four varieties of this bone disease it is necessary to consider to which group the case belongs.

Ossification in the growth served to exclude two, namely parosteal sarcoma, whose origin is in the ensheathing fibrous layer of the periosteum, and the commoner osteolytic form (Fig. 4) arising in the osteogenetic cells. This latter causes porosity of bone, so that spontaneous fracture is common.

There remain the two types associated with a

deposition of bone. One is known as the sclerosing form of osteogenetic sarcoma (Figs. 5 and 6), and the other as Ewing's tumour of bone, which in 1920 was segregated from the other bone sarcomata by Ewing. The justification for this new distinction is apparent in this comparative table based on the illuminative description of bone tumours in Geschickter and Copeland's book[3] on the subject.

EWING'S SARCOMA.		SCLEROSING OSTEOGENETIC SARCOMA.
5–15 years.	*Age.*	15–25 years.
Average thirteen months. General condition fair. Slight rise of temperature may occur.	*History.*	Average ten months. Marked wasting.
Thickening of the cortex due to laying-on of thin, dense layers of bone produces onion-peel appearance.	*Site.*	Thickening of sub-periosteal osteoblastic tissues and ossification in spicules, rising radially from the cortex produces sun-ray appearance.
Small round cells like lympho-sarcoma.	*Histology.*	Large osteoblasts seen.
Radio-sensitive.	*Irradiation result.*	Radio-resistant.
Multiple metastases in skull and other bones, also in lungs and lymph nodes.	*Late stages.*	Metastases in lungs and lymph nodes.
Reduce with radiation, then amputation.	*Treatment.*	Amputation.
4 out of 24 (17 per cent.).	*Prognosis. Well at five years after amputation or excision.*	16 out of 60 (27 per cent.).

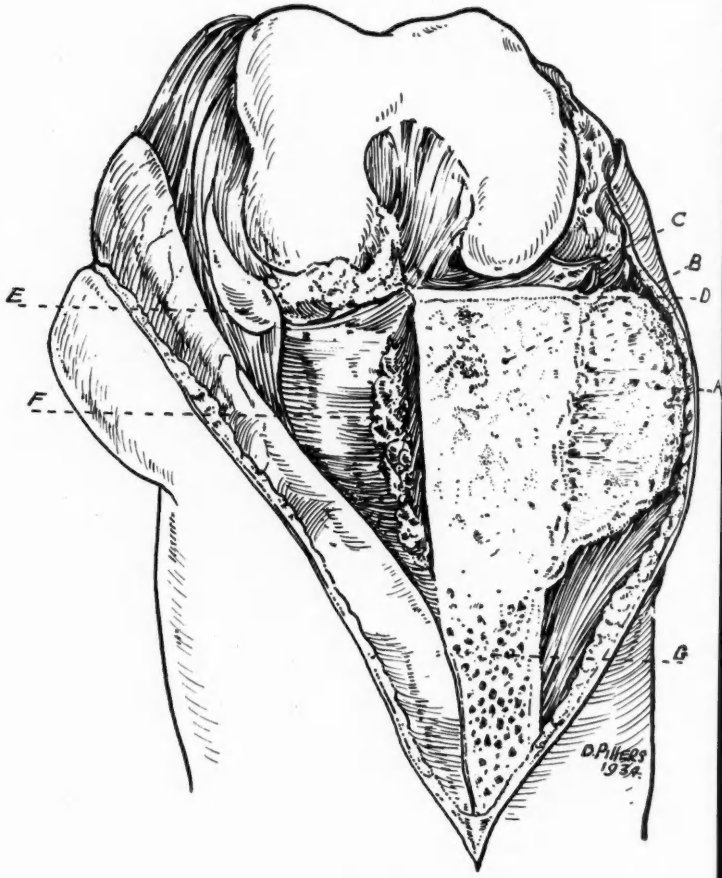

FIG. 6.

Sclerosing sarcoma, amputation specimen.
Tibia split vertically and opened out.

A—New growth in section. B—Sclerosed bone marrow. C—Internal semi-lunar cartilage. D—Articular cartilage tibia intact. E—Patella (normal). F—Outer surface tumour. G—Normal bone marrow.

Considering the case of M. N. in the light of this table it seems justifiable to classify her neoplasm as Ewing's tumour of the femur. On clinical examination the tumour was felt to rise gradually from the level of the unaffected bone, whereas characteristic in sclerosing sarcoma is the abrupt junction its uprising contour makes with the adjacent bone. (Fig. 6.) The skiagram (of a section prepared after operation) confirms this feature and shows a dense laminated deposit on the femur (Fig. 1B), and there are points, both in clinical and the earlier histological investigations, suggestive of infectious disease. Had I known of the therapeutic test based on its distinguishing radiosensitivity, deep X-rays would have been used to see if retrogression resulted. Such a response occurs notably in lymphatic disorders, which lends support to Kolodny's theory[3] of a lymphatic origin for Ewing's sarcoma.

The happy post-operative sequel so far has afforded no opportunity for further study as to the type of sarcoma in M. N. Subsequent history may yet throw light on the case, but despite the many suggestive clinical and naked-eye features that seem to favour Ewing's tumour, Professor Walker Hall (9th April, 1934) confirms the opinion that the case is histologically one of sclerosing sarcoma.

Certainly this case of sarcoma of the upper end of the femur, whatever its exact type, shows how great may be the value of amputation in this awful disease of young life.

Reviewing the literature, it seems reasonable to hope that with the help of our improving radiological evidence and a keener clinical effort amputation will

not be marred by preliminary explorations and tedious investigations. Granted this improvement in diagnosis, the recurrence rate after amputation is likely to fall.

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THE EXPULSION OF BILE.*

BY

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IT is generally recognized that the principal factors responsible for the flow of bile into the intestine are the hepatic secretory pressure and the activity of the gall-bladder. In conjunction with these must be considered the resistance offered to the passage of bile by the structure and activity of the terminal portion of the common bile-duct and the neighbouring part of the duodenum.

HEPATIC SECRETORY PRESSURE.

This factor has been very fully investigated in dogs by, amongst others, McMaster and Elman,[1] who employed the method of "altercursive intubation"; the cystic duct is ligated, and the common duct cut and doubly cannulated in such a way that the bile travels from the liver through a rubber tube passing through the abdominal wall and back through a similar tube into the lower part of the common duct; outside the body the two tubes are joined by a T-piece, which enables the bile pressure to be measured on a manometer. After the taking of food the liver will secrete bile against a progressive resistance until the pressure reaches about 350 mm. of bile, when secretion ceases. The importance of this factor in

* Summary of a Paper read at a Meeting of the Bristol Medico-Chirurgical Society on 11th April, 1934.

bile expulsion is especially obvious in animals which do not possess a gall-bladder, *e.g.* horse, deer, rat.

DUODENAL RESISTANCE.

This consists of the sphincter of Gage (Oddi), surrounding the end of the common duct, and the muscle of the duodenal wall through which the duct passes obliquely. The resistance, as determined in the dog by the method of altercursive intubation,[2] varies considerably. At its lowest, during digestion, the pressure necessary to force bile into the duodenum is about 80 to 100 mm. bile. It is at its highest when fasting, when it is at least 200 mm., and much higher values than this have been recorded; this fact, coupled with the more or less steady secretion of bile by the liver, is probably responsible for "starvation icterus."

The flow of bile from the papilla of Vater is intermittent, being almost always synchronous with duodenal motility. In general the flow occurs when the tone of the duodenal muscle is low, and is stopped when there is increased tonus in the neighbourhood of the papilla. The passage of a peristaltic wave down the duodenum may result in a spurt of bile from the papilla when the wave first reaches it, owing to a "milking" action of the duodenal muscle on the oblique intramural portion of the common duct; this certainly occurs in the dog, where this part of the duct is long and very oblique.[3]

Towards the end of digestion, as the duodenal resistance increases, less bile flows into the duodenum, a large part of it being diverted into the gall-bladder.

GALL-BLADDER.

The position of the gall-bladder as a diverticulum of the main extrahepatic biliary channel is of particular

importance in relation to the movement of the bile. There is overwhelming evidence that when the duodenal resistance is high enough to prevent any considerable flow of bile into the duodenum, *e.g.* in the post-digestive period, bile is side-tracked into the gall-bladder. As measured in the dog, the pressure in the ducts must be at least 60 mm. bile before the bladder commences to fill ;[1] and the greater the duodenal resistance the more bile will flow into the bladder. This process is favoured by the relative thinness and extensibility of the gall-bladder wall and by the considerable power possessed by its mucosa to absorb fluid from the bile. The capacity of the bladder for absorption of water is indicated in experiments with altercursive intubation without ligature of the cystic duct ; under these conditions the pressure in the dog's biliary system does not rise above 100 mm. bile during the post-digestive period, when little bile is flowing into the duodenum.

The gall-bladder, by filling when bile is not required for digestion and, as is well recognized, by concentrating its contents, thus acts as an ideal reservoir for the storage of the important dissolved constituents of the bile until they are needed during the next digestive period.

Although one or two people have expressed the opinion that bile which enters the gall-bladder does not leave it by the cystic duct under normal conditions, being completely absorbed,[4] this is not generally believed ; and there is no doubt that evacuation of its contents through the biliary ducts normally occurs, as is evidenced by the flow of concentrated " B " bile into the duodenum soon after food is taken. The method of cholecystography, moreover, shows a shadow of decreasing size during the digestion of a meal ; and dyes, sand, etc., placed in the gall-bladder in animals have been shown to leave it during digestion.

Possible methods of evacuation.—The gall-bladder possesses a definite muscle coat, which has been shown to undergo slow spontaneous rhythmic contractions.[5,6] By the method of "triple intubation" (altercursive intubation with, in addition, cannulation of the gall-bladder) McMaster and Elman[1] showed that the pressure in the dog's bladder during digestion may reach 250 mm. bile or more as a result of tonic contraction of its muscle. By cholecystography in man and animals contraction rings have been seen in the bladder wall, also the shifting of stones; and occasionally the gall-bladder contents thus visualized have been seen to pass momentarily into the hepatic ducts as well as down the common duct during the digestion of a fat meal, indicating a slightly higher pressure in the bladder than in the liver. By direct observation in animals many have seen contractions of the bladder wall; and in a few cases this has also been noted at laparotomy in human subjects when suitable materials have been placed in the duodenum by intubation, "B" bile being obtained by duodenal suction synchronously with the contractions.

Some have doubted the effectiveness of the relatively thin gall-bladder muscle to expel its contents by active contraction, believing that its function is rather to adapt itself by increasing tone to the progressive reduction of the bile in the bladder produced by, for example, the milking action of duodenal peristalsis on the lower part of the common duct. In experimental acute cholecystitis,[7] however, when the bladder muscle does not contract and duodenal movements are unaffected, evacuation of the bladder contents does not occur; and if the common duct is cut above the duodenum evacuation from a normal bladder still occurs with feeding of appropriate substances. There is, therefore, no doubt that the

gall-bladder does actively expel its contents by muscular contraction under suitable conditions.

There is a possible accessory mechanism assisting the evacuation of the bladder bile. Graham and his colleagues[8] have emphasized the importance of the considerable amount of elastic tissue in the bladder wall, and have shown that the contents of a rubber balloon substituted for the gall-bladder are partially evacuated with similar time relationships to those of a normal gall-bladder. This is explained by the stretching of this elastic tissue by bile entering the bladder from the liver when the duodenal resistance is high, and by the subsequent recoil of the elastic fibres when the resistance falls, thus expelling bile into the common duct and duodenum. In fact, the elastic wall of an isolated gall-bladder behaves similarly to a rubber balloon when subjected to identical changes in internal pressure,[9] though it must be noted that only partial emptying of either ever occurs. This factor is almost certainly of slight importance as compared with the muscular contraction considered above, although it may play a part in the evacuation of the bladder contents early in digestion when the bladder itself is considerably distended.

Other suggested factors, which probably play no part (or at the most a very slight one) in the actual expulsion of bile, include siphonage at the junction of the cystic, hepatic and common ducts, gravity and changes of intra-abdominal pressure.

Conditions of evacuation.—The gall-bladder has been seen to evacuate in a variety of conditions, *e.g.* (1) moderate vagal stimulation; (2) the use of parasympathomimetic drugs, of pituitrin and sometimes of histamine (when the common duct is not too tightly constricted by the duodenal muscle); (3) stimulation of the pyloric region and distension of the stomach;

(4) in some animals the sight and smell of food (conditioned reflex), though this is said not to be effective if the resulting gastric juice is not allowed to enter the duodenum; (5) dilute hydrochloric acid or a strong solution of magnesium sulphate in the duodenum; (6) when food is eaten. Quite the most powerful gall-bladder evacuant is a meal of egg-yolk and cream.[10] Digested fats are far more effective than proteins and carbohydrates.

Mechanism of gall-bladder contraction. — Partial emptying of the bladder in man has been observed cholecystographically[11] as a result of chewing and ensalivating food, even without swallowing it. This must be a reflex effect, the efferent pathway being presumably the vagus. There is no doubt as a result of experiment in animals that reflex contraction of the gall-bladder muscle follows certain types of stimulation of the stomach and duodenum.[12]

But the completely denervated gall-bladder of the cat and dog expels its contents normally after a fat meal.[13] Therefore an extrinsic nervous mechanism is almost certainly not essential for normal evacuation, and we are driven to consider the possibility of a humoral mechanism. That such a mechanism exists is shown by the following observations.

The human bladder evacuates after the transfusion of blood from a donor who is digesting egg-yolk, but not after transfusion from a fasting donor;[14] and cross-circulation experiments in animals show that the presence of dilute hydrochloric acid in the duodenum of one animal evokes contraction of the gall-bladder of the other animal as well of its own. There is conflicting evidence as to the efficacy of absorbed food substances in the blood-stream producing a direct stimulation of the bladder muscle, and most workers in this field doubt this possibility. We are

then left with the possibility of the production of a gall-bladder hormone, liberated into the blood as a result of the action of food substances, etc., on the wall of the small intestine.

It was shown by Brugsch and Horsters[15] that gall-bladder contraction could be induced by secretin, the hormone which arises from the small intestine and stimulates the production of pancreatic juice. This suggestion was reinvestigated by Ivy and Oldberg,[16] who found that intravenous injection of preparations of secretin extracted from the duodenum caused a rapid rise of gall-bladder pressure to about 240 mm. bile in dogs, which lasted from one-half to one hour. The administration of such extracts at ten minute intervals frequently emptied the gall-bladder within an hour. The response of the gall-bladder muscle is a general increase in tonus. Further, purification of the duodenal extracts showed that this active substance, though very similar to it chemically, was not identical with secretin and could be separated from it, and the name "cholecystokinin" was proposed. When this material is injected intravenously in animals and human subjects in very small doses gall-bladder contraction, and sometimes complete emptying, results.

SUMMARY.

The existing state of our knowledge of the principal factors normally promoting bile expulsion can thus be briefly summarized.

The fundamental factor is the secretory pressure of the liver, modified by the resistance offered to the flow of bile by the degree of tone of the common duct sphincter and of the duodenal muscle. This factor is augmented by the active contraction of the muscle of the gall-bladder expelling its contents during

digestion, and brought about partly by reflex stimulation, but chiefly by the action of a hormone liberated from the upper intestine when digested foods (principally fats), gastric acid, etc., pass into it from the stomach. To a slight extent this evacuation of the gall-bladder may be assisted early in digestion by the elastic recoil of the bladder wall when the duodenal resistance to the flow of bile in the common duct is lowered.

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Reviews of Books

The Physician's Art. By A. G. Gibson. Pp. viii., 237. Oxford: Clarendon Press. 1933. Price 7s. 6d.—The greater part of this delightful little book consists of aphorisms and discussions on the work and life of an ideal physician, reminding one much of Osler's Æquanimitas. The sections on Diagnosis, Prognosis and Treatment are full of invaluable suggestions and warnings, culled from a wide experience of men and of disease. Equally important are the pages on medical ethics and on the doctor's care of himself. The initial chapter has an interest of its own, for it contains a reprint of John Locke's *De Arte Medicâ*, 1669, an inquiry as to the method by which medicine can be best improved. This was a very urgent question at that time, for it was clear that the old logical method by framing hypotheses and making deductions was useless, and Locke's great friend and teacher, Sydenham, had decided against the plan of building up medicine by the laws of the new physical sciences, and fell back on the Hippocratic method. In this paper Locke seems to have struggled in vain to reach a solution, but it is significant that the very next year he found that human thoughts and words were so loose and uncertain that he turned himself to psychology and began his immortal *Essay on the Human Understanding.*

Behind the Doctor. By Logan Clendening. Pp. xxi., 458, xi. Illustrated. London: William Heinemann Ltd. 1933. Price 21s.—This is a history of medicine of a new type, by an American writer, and primarily intended for the lay reader. The style is clear and attractive, and the author shows remarkable mastery of his subject and a marvellous industry in the collection of facts which were scattered over a wide literature. A large part of the book, after a rather sketchy account of primitive magic, is taken up with brilliantly-written conversations by or interviews with the discoverers and great teachers of every age. Now these stories are many of them perfectly authentic or, where they are imaginary, they expound the man's teaching as faithfully as possible.

Thus we have an interview between Galen and his patient, the Emperor Marcus Aurelius, another between Sydenham and young Hans Sloane, both of which actually took place; while there is actual evidence for the story of the discoverer of morphine being nearly poisoned by it, and for the picture of Addison and Richard Bright going round their wards teaching their students. The author inquires where is the statue to Sir Humphry Davy, Bristol's discoverer of "laughing gas"; it stands, of course, looking down the main street of Penzance. Very rarely can any inaccuracy be found in the account, though the misprint "forcibly interred" (p. 239) for "interned" is somewhat startling. And in the comparison between inoculation and vaccination on page 217 there should be a definite clause added that the former creates new centres of infection from which the disease may easily spread, whereas the latter does not: without this the account is misleading. But, taking the book as a whole, it is a lively, instructive and entertaining account of the development of medical science up to the present time, with numerous amusing biographical details, illustrations and portraits that will appeal probably even more to the medical man than to the layman.

Applied Physiology. Fifth Edition. By SAMSON WRIGHT, M.D. Pp. xxxii., 604. Illustrated. London: Oxford University Press. 1934. Price 18s.—In the new edition of this valuable text-book the whole matter has been thoroughly revised and brought up to date. This has necessitated a certain amount of rearrangement of the material, and many new illustrations have been added. Happily the book has thereby been but little increased in size, thanks to judicious pruning and to the deletion of obsolete material. It would appear, however, that clinical applicability is not always the main factor influencing the selection of matter. For instance, there is no clear account of the physiology of sight or hearing, which has been omitted, according to the Preface, to economize space, whereas several pages are devoted to the neck and otolith righting reflexes; but possibly these are important to the student of physiology if not to the clinician. While the book is perhaps not quite suitable for the beginner, it will continue to be indispensable both to clinical students and to practitioners anxious to keep abreast with the advances of physiology, and especially to those reading for higher medical examinations.

A Text-book of Medicine. Fourth Edition. Edited by FREDERICK W. PRICE, M.D. Pp. xlv., 1,995. Illustrated. London: Oxford University Press. 1933. Price 36s.—In the new edition of this popular text-book the whole subject-matter has been thoroughly revised, many articles having been rewritten and some new articles incorporated. Unfortunately, this has led to a further slight increase in the size of the book. Although thin paper is used in this, as in previous editions, the poor quality of the print noted in our review of the third edition has been considerably improved. The majority of the articles are excellent, and maintain the high standard set in the previous editions. A typical example of the way in which the work has been brought up to date is the article on "Erythema Nodosum," by Lord Horder. The illustrations are clear and well reproduced, but there appears to be rather a preponderance of pulse tracings and electro-cardiograms. This edition will doubtless retain and increase the popularity earned by its predecessors among both students and practitioners of medicine.

The Chances of Morbid Inheritance. Edited by C. P. BLACKER, M.D. Pp. xi., 449. Illustrated. London: H. K. Lewis & Co. Ltd. 1934. Price 15s.—This appears to be the first serious attempt, by a series of specialists, to put before the general practitioner a synopsis of the knowledge necessary to deal with the not infrequent requests made by the public for eugenic prognosis. The intelligent layman is definitely beginning seriously to consider the effect of sound and unsound mating, and his appeal is to the medical profession; the time has come when the latter can no longer consider a knowledge of eugenics as relatively unimportant, instead of being, as it is, the keystone to the ultimate success of medicine in its prevention and handling of disease and hereditary defects. The space devoted to each subject has been in proportion to the frequency of demands for guidance from the general practitioner by the layman, rather than to the extent of the knowledge acquired of hereditary influence in a particular disorder. Eugenics has two sides, the positive, that is the furthering of the propagation of sound stock, and the negative, the prevention of the multiplication of those with bad heredity. The negative side is particularly dealt with in this book, that with which the man in general practice is constantly in contact, and with which an increasing demand will be made on his knowledge of the subject, for the public

is being steadily educated to its importance. The articles are well abreast of present knowledge, and deal lucidly and impartially with the subject so far as our present knowledge goes, although a better grasp would be acquired of what is here set out if the reader unacquainted with the problems of heredity would first study such a brief outline as Pannett's *Heredity*. Numerous references will be found for those who wish to extend their knowledge of the subject.

Clinical Investigation of Cardiovascular Function. By V. PACHON and R. FABRE. Translation by J. F. HALLS DALLY, M.D. Pp. xi., 252. Illustrated. London: Kegan Paul, Trench, Trubner & Co. Ltd. 1934. Price 15s.—This book is published in a series known as the "Anglo-French Library of Medical and Biological Science," the object of which is to promote greater interchange of scientific thought between the two countries. Monographs written by authorities on the subject in France are translated and published in English, and *vice versa*. The present book deals with the various methods of investigating the functions of the cardio-vascular system, and includes detailed consideration of direct cardiography and the various uses of oscillometry. It is particularly interesting to read the views of the originator of these two methods of clinical investigation, especially in view of the increased importance which oscillometry is assuming in the study of peripheral vascular disease. Although English clinicians do not attach so much value to some of these methods as do the authors, the book is of considerable value in giving a clear and concise exposition of these special features of French cardiology. The translation is well done, the type clear and easily read, and the illustrations ample.

Vitamins and Other Dietary Essentials. By W. R. AYKROYD, M.D. Pp. x., 218. London: William Heinemann Ltd. 1933. Price 7s. 6d.—"Aykroyd on Vitamins" is the standard work on the subject. He has given a brief and readable account of the vitamins and the effects of their presence or absence from human dietaries. Beyond this he has presented in his book a short but comprehensive survery of the practical problems of nutrition. He drives home his observations with a humour somewhat reminiscent of Sydney Smith. "Under-nourished children," he writes, "are apathetic, do what they are told and are generally all that an adult can desire of

children." Or elsewhere, discussing the investigations into the causation of pellagra, he mentions that a number of commissions appointed by the United States Government had failed to make headway with the problem. "No real discovery," he concluded, "is ever made by commissions." Many excellent books have been written on "Nutrition," here is incomparably the best one on 'Malnutrition."

Essays on Chronic and Familial Syphilis. By GRIFFITH EVANS, D.M. Pp. 91. Illustrated. Bristol: John Wright & Sons Ltd. 1934. Price 7s. 6d.—The latent form of syphilis to which the author introduces us is not ordinary syphilis which has passed into a latent stage, but a disease without chancre, exanthema, gumma, ulcer or Wassermann reaction; transmissible in the same "latent" condition, and to the third generation; characterized pathologically (as far as can be discovered from a far from clear account) by paravertebral lymphadenitis, "which must necessarily by proximity" affect the adjacent visceral sympathetic nerves, and clinically responsible for an enormous mass (or ought we to say the whole ?) of chronic disease. The importance of the therapeutic test has been much exaggerated: if every chronic patient who received benefit from a course of mercury or iodide is syphilitic the disease is indeed almost universal. A large part of the book is devoted to disease of the alimentary tract: nearly every form of chronic glossitis is clear evidence of syphilis. Achalasia and dysphagia with anæmia are considered as one disease, which suggests a very superficial knowledge of even the symptomatology of these conditions. The author repeatedly sneers at "teaching hospitals," implying that the staffs regularly neglect family history and clinical signs: "The routine procedure in hospital practice is to perform a Wassermann reaction, and to dismiss the diagnosis of syphilis when the result is negative," is so grossly untrue that one can only excuse it on the ground of careless proof-reading. It is, of course, true that a responsible member of a hospital staff requires something more than a vague hypothesis before making a diagnosis; he would never accept the "cancer family," of which both parents and five out of six adult children "died of cancer of the stomach," without at least some pathological confirmation. From the title of this book we hoped that it was a clear, well-reasoned reminder that the physician must be ever on the watch for

the protean manifestations of syphilis; as it is, exaggeration and a complete absence of logical and critical faculties leave the reader irritated but unconvinced.

Venereal Disease. Fifth Edition. By HUGH WANSEY BAYLY. Pp. xv., 260. Illustrated. London: Chapman & Hall Ltd. 1934. Price 10s. 6d.—This is the most outspoken and stimulating book on this subject that has been presented for a long time. The author makes bold statements that will arrest attention, especially in the section of the book that deals with prevention and with the place and prevention of venereal disease in modern life. His plea for standardization of the methods of diagnosis and treatment is sound. Syphilis is dealt with in a very comprehensive manner in over a hundred pages; in particular, the primary stage is well described, which should be a boon to students of to-day, who do not see so many Hunterian chancres as did their predecessors. The methods of treatment are carefully described, as are the uses of the microscope and Wassermann reaction in diagnosis, and the need for examination of the cerebro-spinal fluid in some cases before accepting the patient as cured. Gonorrhœa receives adequate attention without much matter that is new; the uses of the urethroscope might have had greater prominence. Certain other conditions that may be confused with venereal infection, for example genital herpes, are also carefully described, a point of considerable importance for those without much practical experience. The plates are extremely interesting and well produced. The many new features of this edition will be welcomed by students whose requirements are always kept in mind.

A Synopsis of Public Health. By E. W. CARYL THOMAS, M.D., B.Sc., D.P.H. Pp. vii., 646. Bristol: John Wright & Sons Ltd. 1932. Price 21s.—Dr. E. W. Caryl Thomas, Medical Officer of Health, Dagenham, has added another volume to the well-known "Synopsis" Series published by John Wright & Sons. This book deals with "Public Health" according to the curriculum for the D.P.H. Of its twenty-two chapters the first six deal with epidemic and communicable diseases and the various enactments dealing with them. The descriptions of the diseases are so admirably summarized that one might recommend the book to practitioners for this feature alone. Deficiency diseases, on the other hand, are by

no means adequately described, although many of them are mentioned in the chapter on "Food and Dietetics." The same criticism might apply to some of the occupational diseases, for instance, silicosis. It would have been of greater value perhaps to have given more space to the clinical manifestations of these less familiar conditions and economized on the "fevers." Apart from this there is nothing but praise to be given to a book whose compilation must have been most difficult. The author has been most successful in blending the medical, bacteriological and chemical aspects of his various topics with the law in connection with them. As an instance, section 3 of chapter xiii may be referred to, which compresses into four pages the subject of "Schools and Infectious Diseases." Not only is a tremendous lot of information condensed into mininal space, but the section still remains readable. In part this readableness of the book depends on clever variation in type, in an even greater measure it depends on the choice of clear, short words in well-constructed sentences.

Practical Bacteriology. Fourth Edition. By T. J. MACKIE, M.D., and J. E. MCCARTNEY, M.D., D.Sc. Pp. viii., 504. Illustrated. Edinburgh: E. & S. Livingstone. 1934. Price 12s. 6d.—The fourth edition of this popular practical handbook maintains the high level of its predecessors. The subject, matter is now divided into three clear sections: biology and immunity; technique; diagnosis of infections with descriptions of pathogenic and commensal micro-organisms and viruses. Directions for senior and junior laboratory workers are also subdivided. The book thus offers a comprehensive survey of the whole subject, well arranged and concisely stated. The index is admirably set out and easy for reference. Authors and publisher may alike be congratulated upon a highly valuable issue.

Massage and Remedial Gymnastics. Third Edition. By LOUISA L. DESPARD. Pp. xxiv., 474. Illustrated. London: Oxford University Press. 1932. Price 22s. 6d.—The third edition of this standard text-book of massage is worthy of the high place secured by its predecessors. It is not intended as a means of instruction in massage: indeed, as the author points out, massage can be learnt only by actual practice under a competent teacher. But to enable the student to

understand the principles underlying the actual manipulations such a work as this is essential, and it is difficult to see how it could be better supplied. A full account is given of the anatomy, with numerous coloured illustrations, and clear explanations of the normal functions of muscles, ligaments, bones and nerves, 220 pages in all. Next comes a section describing Swedish remedial exercises and the various procedures that are classed together as "massage," with detailed instruction as to how each measure is applied, what conditions may be thus treated, and what special precautions are needed in particular diseases or with certain patients. The latter part of the book is devoted to electrical methods, including galvanism, faradism, diathermy and electrical baths. There is a very complete index, the book is well printed on good paper, and we must congratulate both author and publisher on the production of a book that every student of massage, masseuse and the practitioner who contemplates treatment of his patients by these essential methods will find complete and indispensable.

Hydrotherapy and Physiotherapy. By LIONEL C. E. CALTHROP, M.B. Pp. 172. Illustrated. London: William Heinemann Ltd. 1931. Price 5s.—This little manual is designed as a guide for the bath attendant who actually administers the particular bath prescribed by the physician at a spa. In it are described the features of various forms of bath, pack, douche, etc., in simple, non-technical language. Careful directions are given as to the method of receiving a patient "who may be tired, irritable or in pain as a consequence of his disease," precautions to observe in arranging the bath or other treatment, faults to avoid, and a host of other valuable tips—we hope, enough to lead to tips of another description. Some of the statements are rather irritating: "Water is a clear liquid, colourless, tasteless and inodorous: in thick layers it has a blue tint." But if we disregard a tendency to obviousness, we have here a book well calculated to serve the reader to whom it is addressed. It is well illustrated, and contains a short, but sufficient, index.

Editorial Note

Liverpool Medical School Centenary.

THE Centenary of the Foundation of the Liverpool Medical School was celebrated on Friday, 11th May, by a large concourse of former students and graduates of the University and delegates from other Universities and the Medical Corporations. The sisterly greetings and congratulations of Bristol University were conveyed by Professor E. Fawcett. The story of the foundation and progress of the School has been told for us by Dr. Gemmell,* who well describes the modest beginnings and early struggles, not unlike those which our own School encountered. From these has emerged a School of Medicine known all the world over for its thoroughness and its enterprise, particularly, of course, for the pioneer work of the School of Tropical Medicine. On behalf of the Bristol Medico-Chirurgical Society we tender our sincere good wishes and heart-felt congratulations on this auspicious occasion.

Obituary

DR. JOHN LINDESAY PEARCE, M.C.,

OF HAMBROOK, NEAR BRISTOL.

DR. JOHN LINDESAY PEARCE, who died suddenly on 10th April, 1934, at the early age of 52, was educated at Clifton College, of which he was a scholar, and subsequently at Edinburgh University, where he graduated M.B., Ch.B. in 1905. After holding resident appointments at Gloucester

* *The Liverpool Medical School*, 1834-1934. Dr. A. A. Gemmell. London: Hodder and Stoughton Ltd. Price 1s.

Infirmary and at Dundee Royal Infirmary he practised at Finchingfield and at Great Bardfield in Essex until 1927, when he came to practise in Hambrook. During the Great War he served three and a half years with the R.A.M.C. in Gallipoli, Egypt and France: he was severely wounded in 1918; his military record was one of distinguished service, and he was awarded the Military Cross for devotion to duty. At Hambrook he was Vice-President of the local branch of the British Legion, and an enthusiastic supporter of the local cricket and football clubs. He took a keen interest in artistic matters, and was particularly well informed in questions relating to the Dutch School. He was a frequent attendant at medical meetings in Bristol. His sound professional knowledge and genial manner rendered him popular with all classes of society, and his loss has been deeply felt in the district. He leaves a widow and one daughter, to whom we extend our most sincere sympathy.

THOMAS JONES,

Captain and Quartermaster, R.A.M.C.(T.);
Steward, Southmead Hospital.

THOMAS JONES began his career with the Guardians of the Parish of Lambeth in 1896, and was subsequently Master of Alresford Workhouse, Hants., from 1903 to 1905. Then, coming to Bristol, he was successively Storekeeper and Master's Clerk at Eastville Institution until he was promoted to be Steward at Southmead Infirmary in September, 1914, in which capacity he watched over the conversion of the Infirmary into a military hospital. In May, 1915, he was gazetted Lieutenant and Quartermaster, R.A.M.C.(T.), and was promoted to the rank of Captain in May, 1918. Those of our readers who worked with him as Quartermaster will admit that it would be difficult to over-praise Mr. Jones's efforts during the War. His administrative competence had been proved before, but he handled his new task with satisfaction to everyone concerned. In 1920 Southmead Infirmary was handed back to the Guardians, and Mr. Jones became Steward, a post which he continued to fill with energy and enthusiasm, despite in the later years failing health, up to the time of his death at the age of 62 on 3rd April, 1934, after a short illness.

He leaves a widow and two sons, to whom our sympathies are extended.

Meetings of Societies

Bristol Medico-Chirurgical Society

THE sixth meeting of the session was held in the University on Wednesday, 14th March, the President, Dr. H. Elwin Harris, in the Chair. Forty members were present.

Dr. F. J. A. Mayes showed skiagrams, Dr. A. D. Fraser pathological specimens, and Mr. E. Watson-Williams a case of **Keratosis Pharyngis.**

Dr. H. Elwin Harris (Jun.) read a short communication on a case of **Double Empyæma,** which was discussed by the President and by Mr. W. A. Jackman.

Mr. A. J. M. Wright then read a paper on **"Focal Infection,"** published on p. 109 of this issue. The paper was discussed by the President, Dr. P. Watson-Williams, Dr. Rayner, Dr. A. T. Todd, and Dr. J. I. Noble.

The seventh meeting of the session was held in the University on Wednesday, 11th April, the President in the Chair. Forty-six members were present.

Mr. F. G. Bergin showed skiagrams and Dr. A. L. Taylor pathological specimens.

Mr. A. W. Adams showed a patient on whom he had operated three years previously for **Sarcoma of the Femur,** and discussed the differential diagnosis; his remarks are published on p. 117.

Professor R. J. Brocklehurst read a communication on the subject of **"The Expulsion of Bile,"** published on p. 131 of this issue. The paper was discussed by the President and Mr. C. A. Moore.

The eighth and last meeting of the session was held in the University on Wednesday, 9th May, the President in the Chair.

Dr. A. D. Fraser showed pathological specimens and Mr. E. Watson-Williams (*a*) a very large foreign body removed from the gullet, (*b*) a case of **Lymphocytoma Malignum** affecting the tonsil, and discussed the varieties of sarcoma that might be seen in the tonsils.

Dr. R. C. Clarke read a short paper on "**Pink Disease.**"

Dr. G. B. Bush read a paper on "**The Clinical Importance of the Intervertebral Discs.**" This was discussed by the President, Mr. F. G. Bergin, Mr. K. H. Pridie, Mr. D. Wood, Mr. A. R. Short, Dr. R. M. Forrester-Brown and Dr. R. C. Clarke.

The Medical Library of the University of Bristol,

WITH WHICH IS INCORPORATED

The Library of the Bristol Medico-Chirurgical Society.

The following donations have been received since the publication of the list in March, 1934.

	June, 1934.
J. Michell Clarke Fund (1)	4 volumes.
Genatosan Ltd. (2)	1 volume.
General Medical Council (3)	3 volumes.
Otago University (4)	1 volume.
Pennsylvania University (5)	1 „
Mrs. Sturmer (6)	4 volumes.
Dr. P. Watson-Williams (7)	1 volume.

Unbound periodicals have also been received from Professor E. W. Hey Groves and Dr. C. Bruce Perry.

THE ONE HUNDRED AND FORTY-SEVENTH LIST OF BOOKS.

The figures in round brackets refer to the figures after the names of the donors. The books to which no such figures are attached have either been bought from the Library Fund or received through the *Journal*.

Auty, C. H. .. .. .. *Modern Inhalation Therapy* 1933

Aykroyd, W. R. .. .. *Vitamins and other Dietary Essentials* .. 1933

Bailey, P. .. .. .. *Intracranial Tumours* .. .. (1) 1933

Bayly, H. W. .. .. *Venereal Disease* .. .. 5th Ed. 1934

Beaumont, G. E., and Dodds, E. C. *Recent Advances in Medicine* 7th Ed. (1) 1934

Bett, W. R., ed. .. .. *Short History of Some Common Diseases by Divers Authors* 1934

Blacker, C. P. ed. .. *Chances of Morbid Inheritance* 1934

Botey, R. .. .. .. *Les Tumeurs Bénignes du Larynx* .. (7) [1932]

Boyd, W. .. .. .. *Textbook of Pathology* 1932

Bryan, C. P. .. .. .. *Papyrus Ebers* .. .. [1930]

Cambridge Natural History, Vols. 2 and 5 .. .. (6) 1895–1896

Cole, A. C. .. .. .. *Studies in Microscopical Science*, Vol. 1 (6) 1883

Cox, G. M. .. .. .. *Clinical Contraception* 1933

Cushny, A. R. .. .. *Textbook of Pharmacology and Therapeutics* 10th Ed. (1) 1934

Dean, E. .. .. .. *Spadacrene Anglica, or the English Spaw* 1736

Gask, G. E., and Ross, J. P. *Surgery of the Sympathetic Nervous System* .. .. (1) 1934

Gibson, A. G. .. .. *Physician's Art* 1933

Giles, G. M. .. .. .. *Handbook of the Gnats or Mosquitoes* (6) 1900

Gunn, J. A. .. .. .. *Introduction to Pharmacology and Therapeutics* .. .. 3rd Ed. 1932

Harrison, G. A. .. .. *Chemical Methods in Clinical Medicine* .. 1930

Hentschel, C. C., and Cook, W. R. I. *Biology for Medical Students* .. 1932

Hutton, I. E. .. .. *Hygiene of Marriage* .. .. .. 4th Ed. 1933

McAusland, S. .. .. *Cure of Hœmorrhoids* 1933

Pachon, V., and Fabre, R. *Clinical Investigation of Cardiovascular Function*. Transl. by J. F. H. Dally 1934

Pearl, R. .. .. .. *Constitution and Health* 1933

Ray, M. B. .. .. .. *Rheumatism in General Practice* 1934

Statham, R. S. S. .. *Outline of Practical Obstetrics for Nurses* 1933

This Panel Business, by A. G. P. 1933

Thomson, J., and Findlay, L. *Clinical Study and Treatment of Sick Children* .. .. 5th Ed. 1933

Webb, P. M. .. .. *Diets* .. .. (2) [1934]

TRANSACTIONS, REPORTS, JOURNALS, ETC.

Bristol Medico-Chirurgical Journal. Combined Index for Vols 1 to 50, 1883–1933 .. .. [1934]

Dentists' Register .. .. (3) 1934

Medical Annual .. .. (3) 1934

Medical and Dental Student's Register .. .. (3) 1933

Medical Register .. .. (3) 1934

Otago University. Proceedings of the Medical School, No. 11 .. (4) 1934

Pennsylvania University. Henry Phipps Institute, 24th Report, 1932–33 .. .. (5) 1933

Quarterly Cumulative Index Medicus, Vol. 14 1933

Surgical Clinics of North America, Vol. 14, Nos. 1 and 2 1934

Publications Received

From EDWARD ARNOLD :

Manipulative Treatment for the Medical Practitioner. By T. MARLIS, M.D. Price 10s. 6d.

From BAILLIERE, TINDALL & COX :

Aids to Obstetrics, 10th Ed. By L. WILLIAMS, M.D., M.S. Price 3s. 6d.

Aids to Operative Surgery. Ed. 2. By C. P. G. WAKELEY, D.Sc. Price 3s. 6d.

From WILLIAM HEINEMANN LTD. :

Handbook of Filterable Viruses. By R. W. FAIRBROTHER, M.D. Price 7s. 6d.

From H. K. LEWIS & CO. LTD. :

The Influence of Heredity on Disease. By L. S. PENROSE, M.A., M.D. Price 5s.

Surgical Anatomy and Physiology. By N. C. LAKE, M.D., M.S., D.Sc. and C. J. MARSHALL, M.D., M.S. Price 30s.

From E. & S. LIVINGSTONE :

Vital Cardiology. By B. WILLIAMSON, M.D. Price 15s.

Advice to the Expectant Mother. Ed. 3. By F. T. BROWNE, M.D., D.Sc. Price 6d.

An Introduction to Practical Bacteriology. By T. J. MACKIE, M.D., and J. E. MCCARTNEY, M.D., D.Sc. Price 12s. 6d.

From MEDICAL PUBLICATIONS LTD. :

Abscess of the Brain. By E. M. ATKINSON, M.B., B.S. Price 21s.

From OXFORD UNIVERSITY PRESS :

Applied Physiology. 5th Ed. By SAMSON WRIGHT, M.D. Price 18s.

The Anæmias. By J. M. VAUGHAN, D.M. Price 12s. 6d.

Nephritis and Allied Diseases. By ROBERT PLATT, M.D. Price 7s. 6d.

From JOHN WRIGHT & SONS LTD. :

Essays on Chronic and Familial Syphilis. By GRIFFITH EVANS, M.A., D.M. Price 7s. 6d.

Local Medical Notes

Long Fox Memorial Lecture.—The twenty-third Long Fox Memorial Lecture will be delivered at the University on Tuesday, 3rd July, 1934, at 5 p.m., by Dr. F. J. Poynton, F.R.C.P. Subject: "Some Aspects of Heart Disease in Children."

Colston Medical Research Fellowships.—The Council of the Colston Research Society, Bristol, offers one or more Fellowships for 1934-35 of not less than £100 per annum for research work primarily in Clinical subjects, though other medical subjects are not excluded. The work must be carried out in the University of Bristol or in any of the Clinical Institutions associated with the University.

Awards will be made in June or July, 1934. Applications should be forwarded forthwith to the Hon. Secretary of the Colston Research Society.

EXAMINATION RESULTS.

University of Bristol.—Students of the University have recently passed the following examinations:—

M.D.—*Pass with Distinction:* H. Rogers. *Pass:* F. H. Bodman, J. J. J. Giraldi, N. L. Price.

CH.M.—*Pass with Distinction:* G. F. Langley.

M.B., CH.B.—*Final Examination* (*Part II.*). *Pass* (*First Class Honours*): A. C. Molden (with Distinction in Surgery, Obstetrics and Public Health. *Pass* (*Second Class Honours*): A. G. W. Branch (with Distinction in Obstetrics), Rosalind M. S. Derham (with Distinction in Public Health), C. H. G. Price. *Pass:* Grace J. V. Ball, Dorothy E. Barber, Violet Fry, N. Greenberg, G. L. L. Gurney, T. R. V. Gurney, Gwladys R. Llewelyn, R. A. Mathews (with Distinction in Surgery and Public Health).

M.B., CH.B.—*Final Examination* (*Part I.*). *Pass:* M. A. Nicholson, B. Ridgway.

M.B., CH.B. (*Part II.*).—*Second Examination. Pass:* Daphne V. Dennis, R. L. J. Derham, P. K. Jenkins, Margaret E. Morgan.

M.B., CH.B. (*Part I.*).—*Second Examination. Pass:* K. A. Hall, J. S. Richardson.

B.D.S.—*Third Examination. Pass:* C. A. Blanden (with Distinction in Dental Mechanics), A. N. Brimelow, C. C. B. Plumley, P. R. Quartley.

B.D.S.—*Second Examination. Pass:* P. H. S. Paine, F. P. Ewens.

L.D.S.—*Second Professional Examination. Pass:* R. E. Buchan, J. G. Coates, T. John, C. L. Read, A. J. Staple.

L.D.S.—*First Professional Examination. Pass:* M. G. Davies, H. W. Williams, R. J. Lee, H. B. Harding, H. D. Williams.

L.D.S.—*Preliminary Science Examination. Pass:* D. C. Bodenham, P. Cairns, C. F. Howell, A. J. H. Orchard, Peggy M. Rooke, D. M. Sanders.

Conjoint Board.—M.R.C.S., L.R.C.P.—*Pass: In Chemistry and Physics:* A. R. Bird. *In Anatomy:* W. White, Mabel L. Glenny. *In Anatomy and Physiology:* F. D. Mowat. *In Medicine:* C. H. G. Price,* Rosalind M. S. Derham,* J. N. Heales.* *In Medicine and Surgery:* A. G. W. Branch,* R. H. Moodie.* *In Surgery:* Dorothy J. Thompson, R. A. Mathews, Violet Fry.* *In Midwifery:* L. E. Sealy, E. J. Perks, S. Roberts. *In Pathology:* Irene G. Hamilton.

L.D.S., R.C.S.—*First Professional Examination. Pass: Part I:* J. G. Jones *Part II.:* E. F. Sumner, J. R. P. Thomas. *Part III.* (*b*): D. J. Dymond.

* Qualified.